

The Examiner takes the position that Lai et al. '004 and Hodgson et al. '439 are deficient only in regards to the recited slope of strain hardening coefficient. In this regard, the Examiner states that he has a reasonable basis to believe that Lai's linear homogeneously branched polyethylene and Hodgson's copolymer (a) each possess substantially the same slope of strain hardening coefficient as required by the claimed invention.

Further, as to Hodgson et al. '439, the Examiner takes the position that Hodgson's (b) low density polymer having a density in the range of from about 0.91 to about 0.935 g/cm³ is the same as the (B) component polymer required by the present invention. The Examiner supports this assertion by directing attention to the patented claims set forth by Hodgson et al. '439.

Finally, the Examiner takes the position that even if the present invention is novel, it still would be obvious in view of Lai et al. '004 or Hodgson et al. '439 because these references generically embrace the claimed invention.

APPLICANTS' RESPONSE

A. The rejection under 35 U.S.C. § 112, second paragraph, will be obviated on entry of the amendment to the claims.

Applicants believe that the amendment to the claims obviates the rejection of Claim 18. Specifically, on entry of the above amendment to the claims, Claim 18 will be withdrawn from examination. Because Claim 18 will be withdrawn from examination, Applicants believe the rejection under 35 U.S.C. § 112, second paragraph, should also be withdrawn.

B. Applicants assert they are entitled under 35 USC § 120 to claim priority to grandparent application number 08/054,379, filed April 28, 1993, as follows:

1. Copendency exists between Present Application '050 and Great-grandparent Application '379. See attached Continuity Flowchart)

- Present application '050 was originally filed on April 11, 1997. See ANNEX 1 - postcard with postal mark of April 11, 1997.

■ On April 11, 1997, parent application number 08/544,497 was pending. That is, '497 was filed on October 18, 1995 (see ANNEX 2 - postcard with postal mark of October 18, 1995) and issued on October 14, 1997 as U.S. Patent 5,677,383 (see ANNEX 3 - first page of USP '383).

■ On October 18, 1995, grandparent application number 08/378,998 was pending. That is:

- i. Grandparent application number '998 was filed on January 27, 1995. See ANNEX 4 - Filing Receipt/Postcard;
- ii. Grandparent application number '998 went abandoned on October 19, 1995. See ANNEX 5 - Office Action mailed April 18, 1995 (paper no. 11 as to '998); Also see ANNEX 6 - Petition for Three-Month Extension of Time, hand-delivered September 21, 1995 according to ANNEX 7 - Postcard.

■ Grandparent application number '998 was filed as a continuation application of '379. See ANNEX 4 - Filing Receipt/Postcard.

■ Great-grandparent application number '379, now abandoned, was still pending on January 27, 1995, the filing date of grandparent application number '998. That is:

- i. Great-grandparent application number '379 was filed on April 28, 1993. See ANNEX 8 - Filing Receipt/Postcard;
- ii. Great-grandparent application number '379 went abandoned on January 28, 1995. See ANNEX 9 - Office Action, mailed July 27, 1994 (paper no. 7 as to '379); see also ANNEX 10 - Petition for Three-Month Extension, mailed January 27, 1995.

Because the present application number '050 was filed April 11, 1997 when parent application '497 was still pending; parent application number '497 was filed October 18, 1995 when grandparent application number '998 was still pending; and

grandparent application number '998 was filed January 27, 1995 when great-grandparent application number '379 was still pending, there is copendency between the present application number 08/834,050 and great-grandparent application number 08/054,379. That is, the copendency requirement of 35 U.S.C. § 120 is satisfied through parent application number 08/544,497, filed October 18, 1995 and issued October 14, 1997 as US Patent No. 5,677,383 and through grandparent application number 08/378,998, filed January 27, 1995 and abandoned October 19, 1995.

2. Continuity of Disclosure exists

The independent claims of the presently claimed invention are as follows (which includes entry of the amendments submitted in the Pre-Examination Amendment, mailed December 11, 1997 as well as the above amendments to the claims):

9. A film made from an ethylene polymer composition, wherein the composition comprises (A) from about 10 percent (by weight of the total composition) to about 95 percent (by weight of the total composition) of at least one homogeneously branched linear ethylene/ α -olefin interpolymer having:
- (i) a density from about 0.89 grams/cubic centimeter (g/cm^3) to about 0.935 g/cm^3 ,
 - (ii) a molecular weight distribution (M_w/M_n) from about 1.8 to about 2.8,
 - (iii) a melt index (I_2) from about 0.001 grams/10 minutes ($\text{g}/10 \text{ min}$) to about 10 $\text{g}/10 \text{ min}$,
 - (iv) no high density fraction,
 - (v) a single melting peak as measured using differential scanning calorimetry, and
 - (vi) a slope of strain hardening coefficient greater than or equal to 1.3; and
- (B) from about 5 percent (by weight of the total composition) to about 90 percent (by weight of the total composition) of at least one heterogeneously branched linear ethylene polymer having a density from about 0.93 g/cm^3 to about 0.965 g/cm^3 .

24. An ethylene polymer composition comprising (A) from about 10 percent (by weight of the total composition) to about 95 percent (by weight of the total composition) of at least one homogeneously branched linear ethylene/ α -olefin interpolymer having:

- (i) a density from about 0.89 grams/cubic centimeter (g/cm^3) to about $0.935 \text{ g}/\text{cm}^3$,
 - (ii) a molecular weight distribution (M_w/M_n) from about 1.8 to about 2.8,
 - (iii) a melt index (I_2) from about 0.001 grams/10 minutes ($\text{g}/10 \text{ min}$) to about $10 \text{ g}/10 \text{ min}$,
 - (iv) no high density fraction,
 - (v) a single melting peak as measured using differential scanning calorimetry, and
 - (vi) a slope of strain hardening coefficient greater than or equal to 1.3; and
- (B) from about 5 percent (by weight of the total composition) to about 90 percent (by weight of the total composition) of at least one heterogeneously branched linear ethylene polymer having a density from about $0.93 \text{ g}/\text{cm}^3$ to about $0.965 \text{ g}/\text{cm}^3$.

Originally filed Claims 9 and 24 of great-grandparent application number 08/054,379 are as follows:

9. A film made from an ethylene polymer composition, wherein the composition comprises from about 10 percent (by weight of the total composition) to about 95 percent (by weight of the total composition) of:

- (A) at least one homogeneously branched linear ethylene/ α -olefin interpolymer having:
- (i) a density from about 0.89 grams/cubic centimeter (g/cm^3) to about $0.92 \text{ g}/\text{cm}^3$,
 - (ii) a molecular weight distribution (M_w/M_n) from about 1.8 to about 2.8,
 - (iii) a melt index (I_2) from about 0.001 grams/10 minutes ($\text{g}/10 \text{ min}$) to about $10 \text{ g}/10 \text{ min}$,
 - (iv) no linear polymer fraction, and
 - (v) a single melting peak as measured using differential scanning calorimetry; and
- (B) from about 5 percent (by weight of the total composition) to about 90 percent (by weight of the total composition) of at least one heterogeneously

branched ethylene polymer having a density from about 0.93 g/cm³ to about 0.965 g/cm³.

24. In a composition comprising at least one homogeneously branched ethylene/ α -olefin interpolpolymer and at least one heterogeneously branched ethylene/ α -olefin interpolpolymer, the improvement comprising incorporating into the composition from about 10 percent (by weight of the total composition) to about 95 percent (by weight of the total composition) of at least one homogeneously branched linear ethylene/ α -olefin interpolpolymer having:

- (i) a density from about 0.89 grams/cubic centimeter (g/cm³) to about 0.92 g/cm³,
- (ii) a molecular weight distribution (M_w/M_n) from about 1.8 to about 2.8,
- (iii) a melt index (I_2) from about 0.001 grams/10 minutes (g/10 min) to about 10 g/10 min,
- (iv) no linear polymer fraction, and
- (v) a single melting peak as measured using differential scanning calorimetry.

The differences between original Claim 9 in great-grandparent application number '379 and the present Claim 9 in '050 are as follows:

1. an amendment to Claim 9 in '050 to correct an inadvertent misplacement of the recitation "(A)." The amendment actually provides conformity with Claim 9 of great-grandparent application number '379 and as such is supported by '379.

2. an amendment to Claim 9 in '050 to change the density range of the at least one homogeneously branched linear ethylene/ α -olefin interpolpolymer from "from about 0.89 grams/cubic centimeters (g/cm³) to about 0.92 g/cm³" to "from about 0.89 grams/cubic centimeters (g/cm³) to 0.935 g/cm³." Support for this amendment can be found in great-grandparent application number '379 at page 7, line 12.

3. an amendment to Claim 9 in '050 to change the recitation "no linear polymer fraction" to "no high density fraction." This amendment corrected a transcription error that is fully supported in great-grandparent application number '379 at page 5, lines 23-27. That is, the substituted term "no high density fraction"

generically refers to homogeneously branched ethylene polymers while the term "linear fraction" or "linear polymer fraction" (at least as used in '050 and '379) refers to heterogeneously branched ethylene polymers such as DOWLEX™ LLDPE resins supplied by The Dow Chemical Company. See great-grandparent application number 08/054,379 at page 5, lines 23-27 and compare with page 13, lines 23-26 and page 14, lines 6-10.

4. an amendment to Claim 9 in '050 to incorporate a slope of strain hardening limitation of greater than or equal to 1.3 as to the at least one homogeneously branched linear ethylene/ α -olefin interpolymers. This amendment is supported in great-grandparent application number '379, for example, by original Claim 10, the Abstract and at page 10, lines 21-28.

5. an amendment to Claim 9 in '050 to more distinctly define the at least one heterogeneously branched ethylene polymer. This amendment is supported in great-grandparent application number '379 at page 13, lines 2-6.

The differences between original Claim 24 in great-grandparent application number '379 and the present Claim 24 in '050 are as follows:

1. an amendment to Claim 24 in '050 to reformulate the claim to dispense with the original Jepson style set forth in great-grandparent application number '379 and as such is supported by '379 as Applicants now favor a standard claim form.

2. an amendment to Claim 24 in '050 to change the density range of the at least one homogeneously branched linear ethylene/ α -olefin interpolymers from "from about 0.89 grams/cubic centimeters (g/cm³) to about 0.92 g/cm³" to "from about 0.89 grams/cubic centimeters (g/cm³) to about 0.935 g/cm³." This amendment is supported by great-grandparent application number '379 at page 7, line 12, the same as indicated above as to Claim 9 in '050.

3. an amendment to Claim 24 in '050 to change the recitation "no linear polymer fraction" to "no high density fraction." This amendment corrected a transcription error that is fully supported in great-grandparent application number '379 at page 5, lines 23-27, the same as indicated above as to Claim 9 in '050.

4. an amendment to Claim 24 in '050 to incorporate a slope of strain hardening limitation of greater than or equal to 1.3 as to the at least one

homogeneously branched linear ethylene/ α -olefin interpolymers. This amendment is supported in great-grandparent application number '379, for example, by original Claim 25, the Abstract and at page 10, lines 21-28.

5. an amendment to incorporate the weight percent and density requirements for the at least one heterogeneously branched ethylene polymer component of the inventive composition of Claim 24 in '050. This amendment provides conformity with original Claim 9 in great-grandparent application number '379 and as such is supported by '379.

6. an amendment to Claim 24 in '050 to more distinctly define the at least one heterogeneously branched ethylene polymer. This amendment is supported in great-grandparent application number '379 at page 13, lines 2-6.

Because all differences between the independent claims of present application '050 (i.e., Claims 9 and 24) and original Claims 9 and 24 of great-grandparent application number '379 are supported by the original description of great-grandparent application number '379, there is continuity of disclosure between present application number 08/834,050 and great-grandparent application number 08/054,379. That is, the continuity of disclosure requirement of 35 U.S.C. § 120 is satisfied because the presently claimed subject matter of 08/834,050 could have been claimed in great-grandparent application number 08/054,379.

3. Common Inventors exist between Present Application '050 and Great-grandparent Application Number '379.

The named inventors of great-grandparent application number 08/054,379 were Pak-Wing Steve Chum, Ronald P. Markovich, George W. Knight and Shih-Yaw Lai. The named inventors for the present application '050 are the same. The 35 U.S.C. § 120 requirement of a common inventor or inventors is satisfied because the inventive entity is the same for both applications.

4. Reference to Parent Application '379 already exists.

In the present specification at page 1, lines 2-17, under the heading "Cross-Reference to Related Applications," as entered by Pre-Examination Amendment, submitted December 11, 1997, a reference to great-grandparent application number 08/054,379 is already provided. The present specification reads:

"This application is a Rule 1.60 continuation application of application number 08/544,497, filed October 18, 1995, now issued U.S. Patent No. 5,677,383, which was a Rule 1.60 continuation application of application number 08/378,998, filed January 27, 1995, now abandoned, which was a Rule 1.62 continuation application of application number 08/054,379, filed April 28, 1993, now abandoned, which was a continuation-in-part application of 07/776,130, filed October 15, 1991, now issued U.S. Patent No. 5,272, 236, the disclosures of each of which are incorporated herein in their entirety by reference."

Because the present application '050 properly sets forth a reference to great-grandparent application number 08/054,379, the referencing requirement of 35 U.S.C. § 102 is also satisfied. Further, to fully comply with 35 U.S.C. § 120, under separate cover, after execution by all named inventors, Applicants will submit a Supplemental Declaration to update the priority claim to great-grandparent application number 08/054,379. Applicants believe with the Supplemental Declaration all requirements of 35 U.S.C. § 120 will be satisfied in the present application, as shown above, and as such the present application will be entitled to the benefit of the filing date of great-grandparent application number 08/054,379, filed April 28, 1993.

C. Rejection under 35 U.S.C §§ 102(e) and 103 as to Lai et al. '004 should be withdrawn because the recited slope of strain hardening coefficient is not an inherent property and/or present priority claim antedates the reference.

In the outstanding Office Action, mailed February 19, 1998, the Examiner rejected Claims 9-31 under 35 U.S.C. § 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over Lai et al. '004. In formulating the

rejection, the Examiner stated that he had a reasonable basis to believe the recited slope of strain hardening coefficient of the present invention is the same for Lai's linear homogeneously branch polyethylene.

However, Applicants do not believe that Lai et al. '004 anticipates the claimed invention because the slope of strain hardening coefficient required by the present invention is not an inherent property of homogeneously branched ethylene polymers. More specifically, Applicants believe not all homogeneously branched ethylene polymers necessarily and consistently possess a slope of strain hardening coefficient value greater than or equal to 1.3. For example, Table 1 at page 12 in the present specification shows several homogeneously branched ethylene polymers which do not meet the recited requirement of the present invention. See Polymers A-D and S-V. As another example, see Markovich's Third Declaration wherein two different homogeneously branched linear ethylene polymers were reported by Applicants to possess slope of strain hardening coefficient values outside of the recited requirement of the present invention.

Further, Applicants submit Lai et al. '004 is not an effective reference against the present invention. That is, the filing date of Lai et al. '004, August 17, 1993, is antedated by the priority filing date of April 28, 1993 to which (as shown above) Applicants are entitled to the benefit of. Because Applicants' priority filing date antedates Lai et al. '004, Applicants respectfully request that the reference be withdrawn as an improper reference against the present invention.

The Examiner will recall that a similar determination was made during the prosecution of parent application number 08/544,497, filed October 18, 1995, and sister application number 08/475,737, filed June 7, 1995, wherein each claimed priority to application number 08/054,379.

D. The present invention is not anticipated by Hodgson et al. '439 because the recited slope of strain hardening coefficient is not an inherent property of homogeneously branched ethylene polymers and/or there is no disclosure of the required (B) component polymer of the present invention.

Applicants deny that the present invention is anticipated by Hodgson et al. '439 because the reference does not disclose all the elements of the claimed invention.

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First, as discussed above in regard to Lai et al. '004, Applicants have demonstrated that the recited slope of strain hardening coefficient of the present invention is not met inherently by homogeneously branched ethylene polymers. Because Applicants have demonstrated that generally there is no inherency with respect to slope of strain hardening coefficient value, Applicants believe the burden has now been shifted back to the Examiner to better support a rejection under 35 U.S.C. § 102(e).

Second, Applicants believe Hodgson et al. '439 disclose blending with high pressure, highly branched (long chain branched) ethylene polymers and does not disclose the (B) component polymer required by the claimed invention which, as amended, is at least one heterogeneously branched linear ethylene interpolymer having a density from about 0.93 g/cm³ to about 0.965 g/cm³.

Specifically, in formulating the rejection, the Examiner relies on the patented claims of Hodgson et al. '439, however, the claims of '439 recite "a low density ethylene polymer prepared by a high pressure polymerization process having a density in the range of from about 0.91 to about 0.935 g/cm³". At Col. 9, lines 14-17, in the specification, Hodgson et al. describe polymer preparation via conventional high pressure, free radical polymerization. Congruent with this description, at Col. 9, lines 17-21, Hodgson et al. describe known high pressure, free-radical polymerized ethylene copolymers such as ethylene acrylic acid copolymers. In their inventive examples, Hodgson et al. employ high pressure low density homopolymer polyethylene (LDPE). As such, Applicants submit the claim recitations provided by Hodgson et al. do not explicitly, implicitly or inherently disclose a heterogeneously branched linear ethylene interpolymer having a density from about 0.93 g/cm³ to about 0.965 g/cm³ as required by or within the meaning of the present invention. That is, within plain meaning, the recitation "a low density ethylene polymer prepared by a high pressure polymerization process having a density in the range of from about 0.91 to about 0.935 g/cm³" is not interpreted, known or referred to as a heterogeneously branched linear ethylene interpolymer having a density from about 0.93 g/cm³ to about 0.965 g/cm³. Because Hodgson et al. '439 provides no disclosure of at least one heterogeneously branched linear ethylene interpolymer having a density from about 0.93 g/cm³ to about 0.965 g/cm³, as required by the

present invention, Applicants respectfully request that the rejection under 35 U.S.C. § 102(e), as being anticipated by Hodgson et al. '439, be withdrawn.

E. The present invention is nonobvious over Lai et al. '004 and Hodgson et al. because the present invention provides unexpected results.

The Examiner's attention is directed to the Third Markovich Declaration. In Table 2, this declaration provides a comparison between Inventive Example AD1, comparative example BD1 and Inventive Example CD1 which clearly and convincingly demonstrates that the present invention provides unexpected results. Note from Table 1 that component (A) of comparative example BD1 has a SHC value of 1.0 (i.e., less than the claimed value) and the two Inventive Examples, AD1 and CD1, comprise component (a) polymers having SHC values within the claimed range at 1.5 and 1.7, respectively. Note also from Table 2 that the Inventive Examples have substantially improved Dynatup impact performance and tear resistance relative to the comparative example. This result is unexpected because other than the difference in SHC values, the examples have about the same I_2 , I_{10}/I_2 , M_w/M_n and density. One of ordinary skill in the art would ordinarily measure these properties and expect equivalent performance for such examples. The dramatic improvement provided by the present invention would be a completely unexpected surprise. Applicants believe that there is simply no way anyone could ever expect or predict that small slope of strain hardening differences between suitable and non-suitable Component (A) polymers would result in dramatic impact/toughness improvements when blended with a suitable Component (B) polymer.

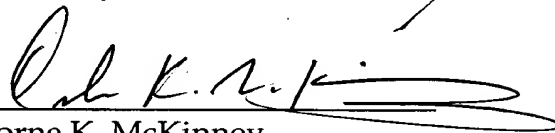
Further, the Examiner may recall that the comparative testing reported by the declaration was based on examples disclosed by Stehling et al. in WO 90/03414. Because Applicants believe they have demonstrated surprising unexpected results relative close art examples, Applicants believe the rejection under 35 U.S.C. § 103 as being obvious over Lai et al. '004 or Hodgson et al. '439 has been obviated and should be withdrawn. That is, Applicant submit the present invention is nonobvious in view of these references alone or in combination.

F. A terminal disclaimer will be filed when subject matter is allowable to obviate the obviousness-type double patenting rejection. As such, Applicants respectfully request that the obviousness-type double patenting rejection be held in abeyance

G. Applicants respectfully request a notice of allowance.

With the removal of the rejections under 35 U.S.C. §§ 112, second paragraph, 102(e) and 103, Applicants believe the present application is in a condition for indication of allowability. As such, Applicants respectfully request entry of above amendments to the claims, recognition of the priority claim to great-grandparent application number 08/054,379, filed April 28, 1993, and an expedient issuance of a notice of allowability for all pending claims, Claims 9, 10, 12-16 and 24-31.

Respectfully submitted,

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ANNEX 1-10 attached
copy of Third Markovich Declaration
Flowchart of continuity chain for 08/834,050
Information Disclosure Statement